Drowsiness is characterized by impairments of performance that can lead to disastrous accidents, in particular in all types of transportation and high-risk industrial plants. Therefore, it is crucial to be able to measure the ability of a person to perform correctly and safely a critical task based on his/her level of drowsiness (LoD). We have thus developed a drowsiness monitoring system based on images of the eye, called photooculography (POG), that determines whether a person is fit for duty.

Methods

For each 1 minute epoch, we computed:

POG-based LoD

Processing

LoD computation using KDS*

PSG-based LoD

α, β activities
and slow eye movements

Results POG vs PSG

Results A

Results B

Conclusion

The results show that the POG-based LoD is in concordance with the physiological reference PSG-based LoD. In addition, the POG-based LoD is strongly correlated with the performance decrements observed during the experiments. This study thus indicates that our POG-based drowsiness monitoring system is able to reliably and objectively detect when a person is too drowsy to properly perform a critical task. This system is thus promising to assess fitness for duty.

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